Biomass energy options and policy integration – Europe and beyond

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Biomass energy offers the possibility to provide a domestic, rural-based, sustainable and low-carbon energy source in both industrialised and developing countries. It will play a crucial role in supplying modern energy services, reducing greenhouse gas emissions and reviving agriculture and forestry. Also, its use is intrinsically linked to agriculture, forestry and the environment. As such it receives consideration within international and national renewable energy, agriculture and forestry, and environmental policy agendas. However, there is a lack of integration across the policy agendas that impedes understanding of the constraints affecting biomass energy and hinders its development. There is a need for policy integration that will make different biomass energy drivers converge and catalyse its economically and environmentally beneficial use.

Diverse biomass energy options are available and the following questions need to be asked: where do opportunities lie for establishing a market for biomass in the short-term, how can short-term opportunities set us on a pathway of biomass options meeting the requirements of future energy demands; and what are the implications for biomass resources. Interesting short-term options appear to be provided by co-firing with coal, blending into motor fuels, district heating, CHP and small-scale heating. However, the viability and support directed at different biomass options needs to address economic, environmental and strategic arguments, including questions such as how climate change policies and mechanisms could make a difference. Also, it is of key importance to understand how biomass energy policy objectives at the EU and national level relate to the above considerations. The main goals of the European Union in the energy sector are to meet the Kyoto objectives, double the share of RES by 2010, improve energy efficiency and improve security and diversity of supply, competitiveness and job creation. In this context, biomass is projected to be a major future contributor to the EU's future primary energy mix. The White Paper on renewable energy indicates a target for biomass and waste in 2010 of 135Mtoe, of which 45Mtoe would be provided by energy crops. It also indicates that the production of liquid biofuels (biodiesel and ethanol) in 2010 would make use of 18Mtoe of biomass from energy crops.

Avoided CO2 emissions associated with current biomass use in Europe (EU15) are estimated at about 3% of the 1998 energy-related CO2 emissions in Europe. Based on practical biomass potential estimates and a range of efficiencies and exploitation levels, it is estimated that biomass could reduce 1998 CO2 emissions levels by between 10 and 20%. The consideration of carbon sinks could lead to significant further reductions in CO2 emissions associated with biomass energy. To foster the development of biomass for energy, it will be important to understand the dynamics of carbon stocks and fossil fuel substitution, recognise their benefits and implement mechanisms that capture GHG-related and other benefits. GHG-related benefits need to be addressed in the international context of the Kyoto Protocol. Economic incentives directed at the build-up of carbon stocks for energy use could prove to be a key factor in the development of biomass for energy, together with learning by doing as the industry grows. Biomass imports may play a role in additional carbon reductions.

The increasing focus of agricultural policy on environmental and rural development aspects of sustainable agriculture could lead to opportunities for biomass energy. The enlargement of the EU will have significant implications on a common agricultural policy and could provide further opportunities for biomass energy. The European Climate Change Programme, which includes a working group on agriculture, recognises not only the importance of reducing GHG emissions associated with agricultural activities, but also the importance of agriculture as a CO2 sink and provider of renewable raw materials to the energy/industrial sector.

If current energy market structures and policies are maintained, renewable energy penetration, including biomass, is likely to remain low. Under such conditions it will be very difficult to meet the carbon emission reductions envisaged by the Kyoto protocol and subsequent deeper reductions likely to be required. Clearly, much needs yet to be done in identifying and implementing viable biomass energy pathways that could contribute to a low-carbon future. Short- to long-term strategies need to be defined and enabling policies understood and implemented in an integrated manner across the different policy agendas.